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Claim 53 was rejected for being an incomplete sentence. In accordance with the Examiner's suggestion, claim 53 has been amended to recite "Ge-containing layer".

Claim 50 was rejected for reciting C as one of the possible groups from which X can be selected. Applicants respectfully note that C is recited as one option from which X can be selected.

The Examiner states that C is a member of group IVa of the periodic table. Based on the Periodic Table defined by the IUPAC, C is a member of group IVb. A copy of the IUPAC Periodic Table Applicants used is submitted herewith along with a copy of the Periodic Table from the CRC Handbook of Chemistry and Physics 75th ed. showing the new IUPAC notation, the previous IUPAC notation, and the CAS notation of the periodic groups. Withdrawal of the rejection is respectfully requested.

Claims 50-52, 55-58, 60 and 74 are rejected under 35 USC 102(b) as being anticipated by Yoshitomi et al. (JP 63-171453). This rejection is respectfully traversed.

Yoshitomi is directed to a magneto-optical recording medium and, thus, does not teach or suggest the phase-change recording layer of the present claims.

Claims 50-52, 55-58, 60 and 74 are rejected under 35 USC 102(b) as being anticipated by Kinou et al. (JP 03-248338). This rejection is respectfully traversed.

Claim 50 is directed to an optical information recording medium comprising a phase-change recording layer and a Ge-containing layer comprising either one selected from the group consisting of GeXN and GeXON. X is one or more elements selected from the following groups: IIIa, IVa, Va, VIa, VIIa, VIII, Ib and IIb, and C.

Based on the IUPAC Periodic table used by the Applicants, the group to which Si belongs is not included. Thus, Kinou does not anticipate the claims by disclosing the use of GeSiZrN. Additionally, Kinou does not teach or suggest the phase-change recording layer of the present claims.

Claims 50-52, 55-58, 63, 64, and 74 are rejected under 102(b) as being anticipated by Yoshioka et al. (JP 04-052188). This rejection is respectfully traversed.

The rejection refers to the fact the Yoshioka discloses an SbGeTe recording layer. While the present invention does disclose a Ge-containing recording layer, based on the periodic table used by the Applicants, the present claims do not require the use of an SbGeTe

recording layer. Sb and Te are not members of any of the groups recited by the claims. Thus, Yoshioka fails to anticipate the claimed invention.

Claims 1, 2, 4-9, 12, 19-31, 50-52, 55-58, 63, 64, and 74 are rejected under 35 USC 102(b) as being anticipated by Yoshioka et al. (U.S. Patent 5,194,363). This rejection is respectfully traversed.

Yoshioka (US '363) discloses an SbGeTe recording layer which differs from the recording layer of the claimed invention. Unlike US '363, the claimed invention does not require a recording layer that includes Sb and Te.

Claims 50-52, 55-58, 60, and 74 are rejected under 35 USC 102(b) as being anticipated by Tsutsumi et al. (JP 02-037548), by JP 01-276453, by Shindo et al. (JP 05-274726), and by JP 04-069833. These rejections are respectfully traversed.

Tsutsumi, JP 01-276453, Shindo, and JP 04-06983 are all directed to a magneto-optical recording medium and, thus, does not teach or suggest the phase-change recording layer of the present claims.

Claims 1-9, 12, 19-31, 50-52, 55-58, 63, 64, and 74 are rejected under 35 USC 103(a) as being unpatentable over Yoshioka et al. (US '363) in view of Yoshioka et al. (JP 04-052188). This rejection is respectfully traversed.

The rejection states that it would have been obvious to one skilled in the art to provide a GeN or GeNO layer on both sides of the optical recording medium of US '363 based on the showing by JP 04-052188 that this layer is beneficial between the recording layer and the upper dielectric layer.

The combination of Yoshioka US '363 and Yoshioka JP 04-052188 does not suggest at the claimed invention as neither reference teaches or suggest a barrier layer including GeN or GeNO and at least one of the following elements: Al, B, Ba, Bi, C, Ca, Ce, Cr, Dy, Eu, Ga, Hf, In, K, La, Mn, Nb, Ni, Pb, Pd, Si, Sn, Ta, Ti, V, W, Yb, Zn, and Zr.

Furthermore, Yoshioka JP 04-052188 defines the optical recording medium as being comprised of a first dielectric layer, a record thin film, a nitride layer, a second dielectric layer, and a reflecting layer. The record film layer of JP 04-052188 is analogous to the active layer of US '363. Yoshioka JP 04-052188 does not teach or suggest a GeN or a GeNO layer on both sides of the recording medium.

Claims 1-31, 50-64 and 74 are rejected under 35 USC 103(a) as being unpatentable over Yoshioka et al. (US '363) in view of Yoshioka et al. (JP 04-052188) and either Yoshitomi et al. (JP 63-171453), Kinou et al. (JP 03-248338), or Shindo et al. (JP 05-274726). This rejection is respectfully traversed.

The rejection states that it would have been obvious to include additives, such as Al, Si, H, and Zr into the GeN and GeNO protective layers of the invention of Yoshioka US '363 as modified by Yoshioka JP 04-052188, based upon the disclosure of equivalent function as protective layers within either Yoshitomi, Kinou, or Shindo.

Yoshioka discloses an optical information recording medium comprising a substrate, a first dielectric layer, an active layer formed on top of the first dielectric layer, a second dielectric layer formed on top of the active layer, and a reflecting layer formed on top of the second dielectric layer (col. 3, lines 31-46). The active layer is a phase change material capable of absorbing energy and being converted between a substantially amorphous state and a substantially crystalline state (abstract).

From this disclosure it is evident that the active layer of US '363 is equivalent to the recording layer and not the barrier layer of the claimed invention. US '363 does not include a barrier layer as part of the recording medium structure. US '363 does disclose two dielectric layers sandwiching the active layer which could possibly be construed as protective layers, however their composition is disclosed as being a combination of ZnS or SiO<sub>2</sub> as opposed to GeN or GeNO as the rejection has suggested.

Additionally, Yoshioka JP 04-052188, as discussed previously, does not teach or suggest a protective layer comprising GeN or GeNO being included on either side of the recording medium. The combination of Yoshioka US '363 and Yoshioka JP 04-052188 does not suggest at the claimed invention. Furthermore, Yoshitomi, Kinou, or Shindo do not remedy this deficiency. Applicants do not concede the applicability of Yoshitomi, Kinou, or Shindo to claims 1-31, 50-64 and 74.

Claims 1-31, 50-64, and 74 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 22-33 of U.S. Patent 5,914,214. This rejection is respectfully traversed.

Applicants provide below a Terminal Disclaimer under 37 CFR 1.321(c) obviating the double patenting rejection. Applicants do not concede the correctness of the reasoning of the rejection.

Claims 1-31, 50-64, and 74 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12, 14-15, 25-27, 30-42, and 54-55 of co-pending Application No. 09/050,762. This rejection is respectfully traversed. Applicants note that Application No. 09/050,762 is not issuing.

#### TERMINAL DISCLAIMER

Petitioner, Matsushita Electric Industrial Co., Ltd., the owner of the entire right, title and interest in the present application filed on September 30, 1999 by virtue of Assignment recorded at Reel 010432, Frame(s) 0867 and U.S. Patent 5,914,214, through the undersigned attorney of record, hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the above-identified application, which would extend beyond the expiration date of the full statutory term of the patent to issue from U.S. Patent No. 5,914,214 and hereby agrees that any patent so granted on the above-identified application shall be enforceable only for and during such period that the legal title to said patent shall be the same as the legal title to the patent to issue from U.S. Patent No. 5,914,214, this agreement to run with any patent granted on the above-identified application and to be binding upon the grantee, its successors, or assigns.

In making the above disclaimer, Petitioner does not disclaim the terminal part of any patent granted on the above-identified application that would extend to the full statutory term as presently shortened by any terminal disclaimer of the patent to issue from U.S. Patent No. 5,914,214 in the event that any such issued patent: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid, is statutorily disclaimed in whole or terminally

disclaimed under 37 CFR 1.321(a), has all claims cancelled by a reexamination certification, or is otherwise terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer, except for the separation of legal title stated above.

For submissions on behalf of an organization (e.g. corporation, partnership, university, government agency, etc.), the undersigned (whose title is supplied below) is empowered to act on behalf of the organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

**In Conclusion**

In view of the above, favorable reconsideration is requested in the form of a Notice of Allowance.

Respectfully Submitted,

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Dated 10/19/2000

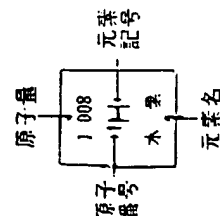
By *John J. Gresens*  
John J. Gresens  
Reg. No. 33,112  
JJG/CDS



## 元素の周期表

1 (1A)		2 (2A)		3 (3A)		4 (4A)	5 (5A)	6 (6A)	7 (7A)	8	9 (8)	10	11 (1B)	12 (2B)	13 (3B)	14 (4B)	15 (5B)	16 (6B)	17 (7B)	18 (8)
1 008 1H 水素		9 012 4Be ベリリウム		21Sc スカンジウム	47.88 22Ti チタン	44.96 21Sc スカンジウム	50.94 23V バナジウム	52.00 24Cr クロム	54.94 25Mn マンガン	55.85 26Fe 鉄	58.93 27Co コバルト	58.69 28Ni ニッケル	63.55 29Cu 銅	65.39 30Zn 亜鉛	10.81 5B ホウ素	12.01 6C 炭素	14.01 7N 窒素	16.00 8O 酸素	19.00 9F フッ素	4.003 2He ヘリウム
22.99 11Na ナトリウム		24.31 12Mg マグネシウム		39Y イットリウム	91.22 40Zr ジルコニウム	88.91 39Y イットリウム	92.91 41Nb ニオブ	95.94 42Mo モリブデン	95.94 43Tc テクネチウム	101.1 44Ru ルチニウム	102.9 45Rh ロジウム	106.4 46Pd パラジウム	107.9 47Ag 銀	112.4 48Cd カドミウム	26.98 13Al アルミニウム	28.09 14Si ケイ素	30.97 15P リン	32.07 16S 硫黄	35.45 17Cl 塩素	39.95 18Ar アルゴン
39.10 19K カリウム		40.08 20Ca カルシウム		88.91 39Y イットリウム	91.22 40Zr ジルコニウム	88.91 39Y イットリウム	92.91 41Nb ニオブ	95.94 42Mo モリブデン	95.94 43Tc テクネチウム	101.1 44Ru ルチニウム	102.9 45Rh ロジウム	106.4 46Pd パラジウム	107.9 47Ag 銀	112.4 48Cd カドミウム	69.72 31Ga ガリウム	72.61 32Ge ケルマニウム	74.92 33As ヒ素	78.96 34Se セレン	79.90 35Br 臭素	83.80 36Kr クリプトン
85.47 37Rb ルビジウム		87.62 38Sr ストロンチウム		137.3 55Cs セシウム	178.5 72Hf ハフニウム	178.5 72Hf ハフニウム	180.9 73Ta タンタル	183.9 74W タングステン	186.2 75Re レニウム	190.2 76Os オスマニウム	192.2 77Ir イリジウム	195.1 78Pt 白金	197.0 79Au 金	200.6 80Hg 水銀	114.8 49In インジウム	118.7 50Sn スズ	121.8 51Sb アンチモン	127.6 52Te テルル	126.9 53I ヨウ素	131.3 54Xe キセノン
132.9 56Ba バリウム		137.3 55Cs セシウム		89-103 アクトノイド	178.5 72Hf ハフニウム	178.5 72Hf ハフニウム	180.9 73Ta タンタル	183.9 74W タングステン	186.2 75Re レニウム	190.2 76Os オスマニウム	192.2 77Ir イリジウム	195.1 78Pt 白金	197.0 79Au 金	200.6 80Hg 水銀	204.4 81Tl タリウム	207.2 82Pb 鉛	209.0 83Bi ビスマス	210.0 84Po ポロニウム	210.0 85At アスタチン	222.0 86Rn ラドン
173.0 87Fr フランシウム		173.0 87Fr フランシウム		89-103 アクトノイド	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム	173.0 87Fr フランシウム
223.0 89Ac アクチン		223.0 89Ac アクチン		89-103 アクトノイド	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン	223.0 89Ac アクチン
227.0 91Pa プロトアクチン		227.0 91Pa プロトアクチン		89-103 アクトノイド	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン	227.0 91Pa プロトアクチン
231.0 93Nb ニオブ		231.0 93Nb ニオブ		89-103 アクトノイド	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ	231.0 93Nb ニオブ
238.0 94Pu プルトニウム		238.0 94Pu プルトニウム		89-103 アクトノイド	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム	238.0 94Pu プルトニウム
244.0 98Cf カリホルニウム		244.0 98Cf カリホルニウム		89-103 アクトノイド	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム	244.0 98Cf カリホルニウム
252.0 102No ノーベリウム		252.0 102No ノーベリウム		89-103 アクトノイド	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム	252.0 102No ノーベリウム
259.0 103Lr ローレンシウム		259.0 103Lr ローレンシウム		89-103 アクトノイド	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム	259.0 103Lr ローレンシウム

元素の原子番号(1-103)の信頼度は、有効数字の4桁目まで1以内であるが、11を付したものは±2以内、12を付したものは±3以内である。  
安定同位体がなく、特定の天然同位体組成を示さない元素については、その元素のよく知られた放射性同位体のうちから1種を選んでその質量数を( )内に示した。



1 Group IA		2 Group IIA		3 Group IIIB		4 Group IVB		5 Group VB		6 Group VIB		7 Group VIIB		8 Group VIII		9 Group VIIA		10 Group IIB		11 Group IIIB		12 Group IVB		13 Group VB		14 Group VIB		15 Group VIIA		16 Group VIIIB		17 Group VIII		18 Group IIIA		19 Group IVB		20 Group VB		21 Group VIB		22 Group VIIA		23 Group VIIIB		24 Group VIII		25 Group IIIA		26 Group IVB		27 Group VB		28 Group VIB		29 Group VIIA		30 Group VIIIB		31 Group VIII		32 Group IIIA		33 Group IVB		34 Group VB		35 Group VIB		36 Group VIIA		37 Group VIIIB		38 Group VIII		39 Group IIIA		40 Group IVB		41 Group VB		42 Group VIB		43 Group VIIA		44 Group VIIIB		45 Group VIII		46 Group IIIA		47 Group IVB		48 Group VB		49 Group VIB		50 Group VIIA		51 Group VIIIB		52 Group VIII		53 Group IIIA		54 Group IVB		55 Group VB		56 Group VIB		57 Group VIIA		58 Group VIIIB		59 Group VIII		60 Group IIIA		61 Group IVB		62 Group VB		63 Group VIB		64 Group VIIA		65 Group VIIIB		66 Group VIII		67 Group IIIA		68 Group IVB		69 Group VB		70 Group VIB		71 Group VIIA		72 Group VIIIB		73 Group VIII		74 Group IIIA		75 Group IVB		76 Group VB		77 Group VIB		78 Group VIIA		79 Group VIIIB		80 Group VIII		81 Group IIIA		82 Group IVB		83 Group VB		84 Group VIB		85 Group VIIA		86 Group VIIIB		87 Group VIII		88 Group IIIA		89 Group IVB		90 Group VB		91 Group VIB		92 Group VIIA		93 Group VIIIB		94 Group VIII		95 Group IIIA		96 Group IVB		97 Group VB		98 Group VIB		99 Group VIIA		100 Group VIIIB		101 Group VIII		102 Group IIIA		103 Group IVB		104 Group VB		105 Group VIB		106 Group VIIA		107 Group VIIIB		108 Group VIII		109 Group IIIA		110 Group IVB		111 Group VB		112 Group VIB		113 Group VIIA		114 Group VIIIB		115 Group VIII		116 Group IIIA		117 Group IVB		118 Group VB		119 Group VIB		120 Group VIIA		121 Group VIIIB		122 Group VIII		123 Group IIIA		124 Group IVB		125 Group VB		126 Group VIB		127 Group VIIA		128
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The new IUPAC format numbers the groups from 1 to 18. The previous IUPAC numbering system and the system used by Chemical Abstracts Service (CAS) are also shown. For radioactive elements that do not occur in nature, the mass number of the most stable isotope is given in parentheses.

1. G. J. Leigh, Editor, *Nomenclature of Inorganic Chemistry*, Blackwells Scientific Publications, Oxford, 1990.
2. *Chemical and Engineering News*, 63(5), 27, 1985.